

January 19, 2007

EXHIBIT 5
DATE 1-19-07
HB 119

Mr. Chairman and members of the Committee: For the record I am Mike Mungas, Regulatory and Safety Engineer, for Nance Petroleum Corporation. Nance Petroleum is an active oil and gas developer in Montana with 85 employees in Montana located in our Sidney and Billings offices.

As Regulatory and Safety Engineer for Nance I am thoroughly familiar with storm water discharges of settlement and the EPA final rule. Consistent with the Energy Policy Act of 2005, EPA published a final rule (effective June 12, 2006) that exempts storm water discharges of sediment from construction activities at oil and gas sites from the requirement to obtain an NPDES permit except in very limited instances. Although sediment discharged from oil and gas-related construction activities alone does not compel permit coverage, the rule encourages operators of oil and gas field activities or operations to implement and maintain best management practices (BMPs) to minimize erosion and control sediment to protect surface water quality during storm events. States may choose to regulate these activities through a non-NPDES permit program.

As proposed in HB 119, the revisions to Montana's water quality regulations (requiring a permit for construction sites of 1 acre or more) will effectively create more stringent standards than required under the Energy Policy Act. This regulation would apply to approximately 1300 sites annually (source: MBOGC permitted 1306 new wells in 2005) and would have a significant economic impact on the industry, as most constructed wellsites exceed one acre in size.

Storm water cases often involve facilities or sites where the cumulative effect of discharges can have significant environmental impact on a watershed. In Montana, most oil and gas wellsites are small (between 1 and 5 acres in area) and are not spaced densely enough to create significant cumulative impacts from stormwater runoff.

Furthermore, the sweeping 1 acre minimum construction size requirement included in HB 119 should not be imposed on the oil and gas industry until more is done to analyze the costs and real benefits associated with those regulations.

In short Nance believes that this bill contains language which is not necessary and urges the Department to step back and work collaboratively with the stakeholders in the oil and gas industry to first determine if legislation is necessary and if so what type of statute can accomplish the most without crippling the industry.

We urge you to table HB 119.

January 19, 2007

Nance Petroleum Corporation (Nance) appreciates this opportunity to provide information and written testimony concerning Montana HB 119 as sponsored by J. Cohenour. The information presented below are significant facts to be considered in assessing the technological, cost-effective and environmental concerns in developing and requiring technology-based treatment requirements or limits for wastes, specifically co-produced waters in conjunction with oil, gas and coalbed (methane) natural gas, CBNG, development in the State of Montana. We also have significant concerns that HB 119 requirements may be applied on a case-by-case basis. As such, the application of the treatment-based requirements, would allow for implementation in a potentially indiscriminate, capricious and biased manner that may be unfounded or unsubstantiated by scientific and technological information.

Technology-based Treatment Requirements

Significant Demands on the State of Montana:

The Board, and departments, would be required to analyze the current and future feasibility of many technological, environmental, and financial factors. Likewise, the State would have to conduct an independent evaluation and conclusion regarding the potential success of achieving the desired treatment-based standard or limits based on information provided by the applicant or researched by State personnel. Economics would need be based on the always fluctuating market value and associated costs of a barrel of produced water per cubic foot of natural gas, CBNG, or barrel of oil relative to "any" water quality parameter likely to affect current, future and unknown potential "beneficial uses". This would be even more complicated by the need for the State to be knowledgeable of changing scientific and technological factors, many of which may be unproven or unrealistically applicable to a site or project. Furthermore, as worded, HB 119 appears to consider establishing limits based on treatment alone, without allowance of and ability for projects to achieve water quality standards involving water blending, beneficial use of the raw water, impoundment-contained infiltration and recharge of the natural water systems, livestock watering, or part of a larger water management plan.

Untreated Water Management – Achievable:

Nance currently operates six (6) Plan of Development (PODs) areas in the Tongue River and Powder River drainages in northeastern Wyoming. As economics and environmental issues within the State of Montana continue to evolve, Nance may develop additional POD areas that are drained by tributaries leading to the middle reach of the Tongue River in Big Horn County, southeastern Montana. Because of site specific considerations as well as feasibility and economics, and after reviewing the feasibility of water treatment processes, Nance has determined that the reliability and costs do not render water treatment a viable solution under its current operational scenario.

Water management alternatives are reviewed on a site specific basis based on produced water and receiving water characteristics, geology of the area, location of groundwater and surface water, beneficial use opportunities, and produced water volumes as well as economics and feasibility. Nance currently manages and discharges produced water from its operations to both lined and unlined constructed earthen off-channel impoundments, constructed on-channel ponds, existing stock reservoirs, injection wells, and center pivot irrigation. Compliance monitoring required by Wyoming has proven the ability of these water management approaches to consistently achieve and meet water quality standards imposed in Wyoming. Permitted discharges to on-channel impoundments in the Tongue River and the Powder River drainages in Wyoming have had effluent limitations based on Montana numeric standards of the receiving water at the Wyoming/Montana border. In the near future, effluent limitations, and salinity and sodium loads in the Powder River drainage may be dictated by an allocation system for available assimilation capacity recently developed by the Wyoming DEQ.

Regional water management practices include beneficial use such as stock water and irrigation, deep and shallow injection, infiltration/evaporation, and process treatment to include continuous countercurrent ion

exchange (CCIX), although the reverse osmosis (RO) treatment process has been initially evaluated. Both processes have been the primary process treatment of choice due to economics, anticipated achievable treatment levels, and reliability. The cost of treatment varies and is greatly affected by location, influent cation levels, effluent limitations and brine disposal options. Each treatment process has limitations and operational constraints which primarily include influent produced water characteristic (water quality).

Technology-based Water Treatment:

The use of the RO process has not been commercially demonstrated with CBNG produced water in the Powder River basin therefore actual data are not available and treatment limits and cost may only be estimated. Actual limits and cost would only be available after long term operation of an RO system using a specific quality and quantity of produced water. Typical commercial processes can achieve recovery rates of about 95% which equates to a brine concentration of almost 20 times the initial influent and about 10 to 25% of the influent volume. Brines are very high in TDS.

The use of CCIX systems are modular and can be placed in varying arrangements for primary and secondary treatment scenarios which involve treated effluent blending. The achievable SAR target level is dictated by the target TDS level. Depending upon effluent target levels, waste brine volumes are estimated at 1 to 10% of the influent volume. The brines are high in TDS, are typically acidic, there will be increased levels of Cl or SO₄; prior to disposal adjustment of the pH must be made. Only CCIX treatment technology has met the higher seasonal constraint for current Montana standards, but only as a result of treatment and blending.

Disposal of Resulting Treatment Wastes:

Additional needs for the treatment related processes would include disposal of large volumes of the brine from either the CCIX or RO processes which are expected to be up to 10 to 25 % of the influent volume. Methods for disposal of brines would potentially include injection in a Class I or II injection well or storage and evaporation in a lined pit. Brine may require pH adjustment prior to injection and would generate sludge that would require storage, drying, characterization, transportation and disposal in a landfill. If a suitable disposal well is not located within a reasonable piping distance of the project site, disposal would have to be accomplished through transportation; this could equate to significant truckloads transporting large volumes of treatment wastes, both liquids and solids on a weekly basis. Resultant solids would either be disposed in place with monitoring, or hauled to a licensed commercial disposal facility or landfill.

Naturally occurring radioactive materials (NORM) such as radium-226 and radium-228 may be of concern with treatment due to the concentrating of the brines as well as the scaling of equipment with long term use. Screening, sampling and disposal would have to be addressed at the time of decommissioning and final reclamation.

Economics of Produced-Water Treatment:

It is important to use wellhead prices to evaluate economic viability. As market prices fluctuate and or if initial produced water to gas ratios increase, treatment even with blending to higher standards may not be economically feasible. Using Department of Energy estimates of wellhead price of natural gas ranging between \$2.88 to \$3.29 per MCF through 2010 or using the EPA estimated equilibrium wellhead price of \$2.72 per MCF (MAR Notice No. 17-31), treatment cost of the CCIX system for meeting the least stringent treatment constraints range from 28% to over 100% of the equilibrium wellhead price.

Again, RO treatment to the existing Montana numeric limits for the Tongue and Powder Rivers have not been directly achieved commercially with CBNG produced water; it is anticipated RO treatment costs would be higher than for a CCIX system under similar system constraints and treatment objectives.

Additional Treatment Operational Constraints:

- **Brine Disposal Wells:** Under certain water quality conditions Class IID (disposal) injection wells may be used for brine disposal. Typical Class IID wells are completed at depths of 10,000 to 14,000 feet and would likely cost upwards of \$3 to \$4 million. The economic injective technology risks associated with a deep Class II well are high as it is unknown until well completion if it can accept injected water, and how long the receiver zone will accept the injectate.

- In many areas of Montana, in particular the Powder River Basin, existing Class IID disposal wells are not situated nearby and the potential for developing new disposal wells is unknown. Costs for disposal, depending upon the well location and distance from the project area may range from less than \$0.10 to over \$1.00 per bbl of brine. Other cost estimates project off-site brine disposal to be \$4 per bbl of brine (\$0.21 per bbl of produced water or \$0.57 per MCF. The need for new disposal wells may increase the treatment cost as much as \$0.27 to \$2.70 per MCF.
- Discharge Outfalls: Multiple outfalls may be required for discharge of the treated effluent for the protection of aquatic life, and may require adjusted flows (seasonal or incidental) to meet in stream conditions. Each outfall for surface discharge of treated water is about \$300,000 in capital cost which includes rip-rap, piping, outfall structures, land, site preparation, insurance and contingency (USEPA 2001). Operational expense was estimated at about \$4,000 per year. This translates into additional cost of \$39,050 per year assuming for a 15 year lifespan. Additional costs would be incurred for required MPDES compliance monitoring and sampling at each outfall.
- Treatment Plant Size: CBNG produced water treatment may not realize economy of scale because development generally occurs by individual project due to permitting time constraints, drill rig availability, time and financial constraints, and the risk of development would not warrant the investment of a large treatment plant until actual production and produced water volumes are realized. In a recent study, ALL Consulting states "If water treatment were the only solution for produced water, the number of treatment facilities would have to increase by a factor of a hundred, causing increased stream flow in areas where irrigation is not suitable" (ALL 2006).

Permits for Construction Sites (1 Ac. or more)

Consistent with the Energy Policy Act of 2005, EPA published a final rule (effective June 12, 2006) that exempts storm water discharges of sediment from construction activities at oil and gas sites from the requirement to obtain an NPDES permit except in very limited instances. Although sediment discharged from oil and gas-related construction activities alone does not compel permit coverage, the rule encourages operators of oil and gas field activities or operations to implement and maintain best management practices (BMPs) to minimize erosion and control sediment to protect surface water quality during storm events. States may choose to regulate these activities through a non-NPDES permit program.

As proposed in HB 119, the revisions to Montana's water quality regulations (requiring a permit for construction sites of 1 acre or more) will effectively create more stringent standards than required under the Energy Policy Act. This regulation would apply to approximately 1300 sites annually (source: MBOGC permitted 1306 new wells in 2005) and would have a significant economic impact on the industry, as most constructed well sites exceed one acre in size.

Storm water cases often involve facilities or sites where the cumulative effect of discharges can have significant environmental impact on a watershed. In Montana, most oil and gas well sites are small (between 1 and 5 acres in area) and are not spaced densely enough to create significant cumulative impacts from stormwater runoff.

Furthermore, the sweeping 1 acre minimum construction size requirement included in HB 119 should not be imposed on the oil and gas industry until more is done to analyze the costs and real benefits associated with those regulations.

Selected References

ALL Consulting. LLC, Feasibility Study of Expanded Coal Bed Natural Gas Produced Water Management Alternatives in the Wyoming Portion of the Powder River Basin, Phase One, U.S. Department of Energy, January 2006.

Bank, Gregory C., Kuustaa, Vello A., Advanced Resources International, Inc., The Economics of Powder River Basin Coalbed Methane Development, U.S. Department of Energy, January 2006.

Board of Environmental Review of the State of Montana, MAR Notice No. 17-231, 19-10/6/05, 2005.

CDM testimony, Board of Environmental Review for the State of Montana, November 2005.

Emit Technologies, Inc., personal communications, July 2005.

Kohut, Jan, JMC Engineering, Inc., personal communications, November 17, 2004.

Montana Board of Oil and Gas Conservation Commission, UIC Information, UIC Wells, <http://bogc.dnrc.state.mt.us/JDLoginWeb.htm>, accessed June 20, 2006.

Onsanger, P.R., Cox, D.O., Aquifer Controls on Coalbed Methane Development in the Powder River Basin, Wyoming, Society of Petroleum Engineers, SPE 63090, 2000.

United States Environmental Protection Agency, BPJ BAT Determination, September 25, 2001, <http://www.epa.gov/region08/water/wastewater/cbm/cbm.html>, accessed June 8, 2006.